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ABSTRACT

This report evaluates a Department of Defense (DOD) demonstration program that would provide trauma care training for military medical personnel through one or more public or nonprofit hospitals. Specifically, it examines DOD's actions to meet legislative requirements of the demonstration program; identifies other initiatives aimed at training military personnel in trauma care; and notes key issues that DOD should address if it expands the program. The report notes that because of the program's late start, it is too soon to assess its effectiveness; the report also notes that DOD has missed the April 1996 expected milestone. Several other initiatives, not limited to the training of general surgeons, were identified as potentially useful in assessing the feasibility of training military personnel in civilian trauma centers. Specific issues for DOD to address include physician licensure requirements, whether civilian trauma centers have the capacity to train large numbers of military personnel, whether military trainees can obtain sufficient experience if they have to compete for training opportunities with the centers' own personnel; and the need to balance wartime medical training with the substantial needs of the DOD's peacetime health care system. Comments of the DOD on this report are summarized. Appendices include a comparison of battlefield diagnoses and peacetime health care. (DB)

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United States General Accounting Office

GAO

Report to Congressional Committees

April 1998

MEDICAL READINESS

Efforts Are Underway for DOD Training in Civilian Trauma Centers

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GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

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April 1, 1998

The Honorable Strom Thurmond
Chairman
The Honorable Carl Levin
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Floyd Spence
Chairman
The Honorable Ike Skelton
Ranking Minority Member
Committee on National Security
House of Representatives

This report responds to Section 744 of the National Defense Authorization Act for Fiscal Year 1996, requiring us to evaluate the effectiveness of the Department of Defense's (DOD) demonstration program that would provide trauma care training for military medical personnel through one or more public or nonprofit hospitals. Specifically, we (1) determined the status of the demonstration program and DOD's actions to meet the legislative provisions, (2) identified other initiatives aimed at training military personnel in trauma care, and (3) identified key issues that DOD should address if it decides to expand its trauma care training program. This report contains recommendations to the Secretary of Defense.

We are sending copies of this report to the Secretaries of Defense, the Army, the Navy, and the Air Force and the Commandant of the Marine Corps. We will also make copies available to others on request.

Please contact me at (202) 512-5140 if you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix III.

Mark E. Gebicke
Director, Military Operations
and Capabilities Issues

Executive Summary

Purpose

Military medical personnel have almost no chance during peacetime to practice their battlefield trauma care skills. As a result, physicians both within and outside the Department of Defense (DOD) believe that military medical personnel are not prepared to provide trauma care to severely injured soldiers in wartime, which could result in the loss of lives and limbs. Because DOD must be better prepared to deliver trauma care during wartime, Congress enacted legislation in 1996 requiring DOD to implement a demonstration program that would provide trauma care training for military medical personnel through one or more public or nonprofit hospitals. This report responds to a requirement in that legislation that GAO evaluate the effectiveness of the demonstration program. Specifically, GAO (1) determined the status of the demonstration program and DOD's actions to meet the legislative provisions, (2) identified other initiatives aimed at training military personnel in trauma care, and (3) identified key issues that DOD should address if it decides to expand its trauma care training program.

Background

DOD and GAO reports on medical operations during the Gulf War questioned the military's ability to meet its wartime medical mission, particularly in providing trauma care to the predicted number of casualties. These reports highlighted that many military medical personnel, including physicians, nurses, and corpsmen, had either never treated trauma patients or had no recent experience. For example, only 2 of 16 surgeons on a Navy hospital ship had recent trauma surgical experience. Military medical personnel receive readiness training in both military and medical combat casualty skills. However, these courses are taught through classroom instruction and field exercises and do not include actual hands-on training with injured patients.

Since most military treatment facilities provide health care to active duty personnel and their beneficiaries and do not receive trauma patients, military medical personnel cannot maintain combat trauma skills during peacetime by working in these facilities. In contrast, civilian trauma centers are specialized hospital facilities with immediately available health care providers and equipment to care for severely injured trauma patients, such as those with penetrating stab or gunshot wounds. Most combat injuries are penetrating wounds resulting from bullets from small arms and fragments from explosive munitions. A 1995 Congressional Budget Office report stated that 98 percent of the cases treated at one civilian trauma center matched those casualty-related diagnoses on the military's list of

battlefield injuries, whereas only 5 percent of the primary diagnoses that military personnel treat match battlefield injuries.

Section 744 of the National Defense Authorization Act for Fiscal Year 1996 required the Secretary of Defense to implement a demonstration program to evaluate the feasibility of providing shock trauma training for military medical personnel through public or nonprofit hospitals. Specifically, the act required DOD to implement a demonstration program at a civilian center not later than April 1, 1996, and submit reports describing the scope and activities of the program to Congress not later than March 1, 1997, and March 1, 1998. In addition, the act required that the agreement between DOD and the civilian center include a provision that the center will provide health care services to DOD beneficiaries that are at least equal to the value of the services provided by the military personnel training in the center.

In August 1996, the Office of the Assistant Secretary of Defense for Health Affairs, which is responsible for DOD's health care system, formed the Combat Trauma Surgical Committee to help develop guidance on improving trauma medical readiness training. In February 1997, the Committee issued a report recommending trauma care training standards for military surgeons, which included both hands-on experience and continuing education. The service Surgeons General approved the recommendations as a first step toward developing a trauma care training program for military personnel.

In April 1997, DOD chose Naval Medical Center Portsmouth, Virginia, to lead the demonstration program. Naval Medical Center Portsmouth signed an agreement with Eastern Virginia Medical School to provide training for Navy surgeons at Sentara Norfolk General Hospital in Norfolk, Virginia. The program, which is currently limited to general surgeons, was initiated in November 1997 and expected to run through March 1998.

Results in Brief

It is too early to assess the effectiveness of DOD's demonstration program because it has only been in place since November 1997 As of March 1, 1998, only four surgeons had completed their training rotations. Also, DOD has not finished the evaluation tool it is developing to assess the program's effectiveness. Due in part to the program's late start, DOD's actions to implement the program have not been fully consistent with the legislative provisions. DOD missed the April 1996 implementation milestone and issued a report on its proposed demonstration program to Congress 5 months late. Further, DOD did not seek an agreement with the civilian

center to provide health care to DOD beneficiaries that is at least equal in value to the services provided by the military trainees, as specified in the legislation. DOD officials believed that such an arrangement might have jeopardized the willingness of hospital officials to enter into the program.

GAO identified several other initiatives that might be used in assessing the feasibility of training military personnel in civilian trauma centers. Unlike the current demonstration program, these other initiatives have not limited their training to general surgeons. Rather, these programs have extended training to orthopedic surgeons, medics, corpsmen, general medical officers, nurses, and physicians. Individual surgeons, military medical treatment facilities, and combat units appear to have initiated these programs to fill the void left by the lack of any DOD or servicewide program for trauma care training. The collective experiences of these programs, together with those of the demonstration program, could provide DOD valuable information in determining the feasibility and effectiveness of training military medical personnel in civilian trauma centers.

DOD will need to address several issues, none of which appear to be insurmountable, if it decides to expand its trauma care training program. Questions have arisen over physician licensure requirements, but state licensure was an issue in only one of six programs that GAO examined. Two additional issues concern whether (1) civilian trauma centers have the capacity to train large numbers of military personnel and (2) military trainees can obtain sufficient experience, since they will compete for training opportunities with the centers' own personnel. The first issue cannot be addressed because DOD has not yet estimated the number and type of medical personnel that might require trauma training. DOD could deal with the second issue by selecting civilian centers that are understaffed because of their large caseloads. In the longer term, better information will be needed on wartime medical requirements, the personnel requiring trauma care training and their priority for such training, and the desired frequency of refresher training. The biggest challenge DOD may face is determining how best to balance the need for wartime medical training with the substantial needs of its peacetime health care system.

Principal Findings

DOD's Demonstration Program Is Not Fully Consistent With Legislative Provisions

Because implementation of the demonstration program was delayed, it is too early to determine its effectiveness. Data from the program is limited because, as of March 1, 1998, only four surgeons had rotated through the program. In addition, no evaluation tool has been completed to capture the data needed to assess the program's effectiveness. The implementation and evaluation of the demonstration program are the responsibilities of the head of the Department of Surgery at Naval Medical Center Portsmouth. This official has many other competing demands and has not been provided any administrative support personnel to assist with the program.

Although the legislation stated that the demonstration program was to be implemented not later than April 1, 1996, Health Affairs did not select the demonstration site until April 1997, and the first rotation did not begin until November 1997. In addition, the law required reports on the program to Congress on March 1, 1997, and March 1, 1998. DOD's first report was not issued until July 24, 1997, and the second report had not been issued as of March 13, 1998. According to Health Affairs and service officials, the delay in implementing the program was due to Health Affairs (1) shifting responsibility for the program between offices, (2) taking time to assess whether two existing military trauma centers could be used to fulfill the legislative mandate for a demonstration program, (3) establishing the Combat Trauma Surgical Committee to develop the minimum training requirements for trauma surgery, and (4) waiting until another ongoing training program at the civilian center was completed.

The agreement between Naval Medical Center Portsmouth and Eastern Virginia Medical School does not contain a provision that the school or hospital would provide in-kind services to military personnel and other DOD beneficiaries, as required by the law. Navy officials believed that, if they had asked for an in-kind service agreement, the medical school would not have agreed to provide the training. Eastern Virginia Medical School officials confirmed that an in-kind service arrangement would not have been acceptable because neither the school nor the hospital receives any financial benefit from this training arrangement and they have adequate resources without the Navy trainees to provide needed trauma care.

DOD's demonstration program only provides trauma care training for general surgeons. The program does not include trauma training for the other medical personnel who would also be expected to take care of the wounded servicemembers, including those who would be the first ones to treat combat casualties on the battlefield. Under the program, general surgeons from the Naval Medical Center Portsmouth are on call every other 24-hour period for 3 weeks at Sentara Norfolk General Hospital's trauma center. The surgery staff at Eastern Virginia Medical School provides and directs the trauma service at the center and supervises the military trainees when they are on call. Participating surgeons said that the trauma training they received in the program was worthwhile, but they reserved judgment on the effectiveness of the program.

Health Affairs had no minimum criteria for selecting the site for a demonstration program other than identifying military treatment facilities that already had affiliations with civilian trauma centers. The Navy suggested Naval Medical Center Portsmouth for the demonstration program because of its affiliations with a local trauma center and medical school. This affiliation consisted of Navy general surgery residents training at the hospital and two trauma-trained Navy surgeons being on call at the local trauma center 3 to 4 nights a month. Although other urban centers might have a greater penetrating trauma training caseload, Sentara Norfolk General Hospital's caseload provided an adequate amount of hands-on trauma care cases.

Other Programs Attempt to Provide Wartime Trauma Skills Training

DOD does not capture data on existing local cooperative programs between the military and civilian trauma centers. Individual physicians, military medical treatment facilities, and combat units initiated programs or established affiliations with civilian trauma centers even though not required to do so by DOD. For example, the Third Marine Aircraft Wing trains its corpsmen and general medical officers at Martin Luther King, Jr./Drew Medical Center, an inner-city trauma center in south Los Angeles that treats over 2,500 trauma patients a year, including about 1,200 penetrating trauma cases. The benefit of this program is that it trains those medical personnel that would be the first ones to treat and stabilize combat casualties. The local programs that GAO identified have generally tended to be short-lived because they have been based on personal initiative rather than on a DOD requirement. Nevertheless, these programs appear to have yielded valuable experiences that could be useful in assessing the feasibility and effectiveness of training military medical personnel in civilian trauma centers.

DOD also provides limited trauma care training in its two trauma centers at Brooke Army and Wilford Hall Medical Centers in San Antonio, Texas. Each center receives about 800 trauma patients per year, about 20 to 25 percent of which are penetrating trauma cases. The benefit of providing trauma care in these military facilities is that they can train all members of the team expected to take care of combat casualties and not just general surgeons. However, hands-on training opportunities at these facilities are limited because of the small number of trauma patients.

Issues Related to Wartime Trauma Care Training Have Surfaced

GAO identified several issues that DOD will need to address if it decides to expand trauma care training for military personnel, but these issues do not appear to be insurmountable. For example, many military medical officials are concerned that they may need a second medical license to train in civilian centers and that they would have to incur the cost of the license. However, some states are allowing military personnel to obtain a training license or register with the state, at no or nominal cost, to train in civilian centers.

Another issue concerns the ability of the civilian centers to train large numbers of military medical personnel. DOD is in the process of updating its wartime medical force structure requirements. Currently, the total number of active duty military medical personnel is about 100,000. DOD's assessment will determine the number and types of personnel that will be needed to meet DOD's wartime requirements. However, until this assessment is completed, the number of personnel who need to be trained in trauma care cannot be determined.

According to some military and civilian officials, civilian hospitals that offer military trainees the most beneficial training are generally teaching hospitals with trauma centers that provide total care for the most severely injured patients. However, since these hospitals have programs that also train civilian physicians in trauma care, the military trainees may have to compete with the civilian trainees for hands-on trauma procedures and decision-making opportunities. The directors from three large trauma centers in Los Angeles, Houston, and Baltimore stated that the large number of trauma patients at many inner-city trauma centers would enable both the civilian staff and the military trainees to get more than enough hands-on experience.

A longer term issue is the need for an overall strategy and plan to address the need for trauma care training. The recommendations in the

February 1997 report of Health Affairs' Combat Trauma Surgical Committee provide a starting point for DOD to begin developing such a plan. However, clear objectives and milestones to build a comprehensive plan must be in place. For example, it is important for DOD to complete its ongoing assessment of wartime medical requirements, determine which personnel require trauma care training, prioritize the personnel to be trained, and determine the frequency with which training will be required.

DOD currently has no system to identify those personnel that will receive trauma care training. The Combat Trauma Surgical Committee recommended that individual trauma care training should be tracked so that trained personnel could be quickly identified if a crisis should arise. Two systems—the Centralized Credentials and Quality Assurance System and the Defense Medical Human Resource System—could be used for this purpose. However, the first system has limitations, and the second system is still being developed.

Another wartime medical training issue is how such training might be handled in the reserves, but this issue was not addressed by the Combat Trauma Surgical Committee. Also, DOD has focused its attention to date only on providing trauma care training to active duty general surgeons. In the longer term, it will also be important to examine the training needs of other medical personnel.

DOD's biggest challenge may be in providing wartime trauma care training while meeting the substantial demands of its peacetime health care system. DOD's primary medical mission is to provide health care to 1.6 million active duty beneficiaries to fulfill its wartime operational objectives. In addition, DOD provides health care to 6.6 million other military-related eligible beneficiaries, such as active duty dependents and retirees and their dependents. Trauma care training will unavoidably compete for resources with the health care services DOD must provide to these beneficiaries.

Recommendations

Additional data is needed to evaluate the feasibility and effectiveness of providing trauma care training to military personnel in civilian centers. Because the authority for the demonstration program at Sentara Norfolk General Hospital expires on March 31, 1998, GAO recommends that the Secretary of Defense consider negotiating a new agreement for a similar program. GAO also recommends that the Secretary (1) expedite DOD's efforts to establish an evaluation tool to assist in an assessment of the

feasibility and effectiveness of training military personnel in civilian trauma centers and (2) broaden the scope of the evaluation to include other individual programs that have provided trauma care training to general surgeons as well as other medical personnel.

If DOD determines that the trauma care training concept is feasible and decides to expand such training in civilian trauma care centers, GAO recommends that the Secretary of Defense develop a long-term strategic plan that establishes goals and identifies actions and appropriate milestones for achieving these goals. This plan should (1) establish criteria for selecting locations for trauma care training that would maximize the experiences of military trainees, (2) identify which medical personnel should receive trauma care training and the frequency of such training, and (3) develop a mechanism to identify those military medical personnel who are likely to deploy early in a conflict so that they can receive priority for medical wartime trauma care training. In addition, this plan should address the training needs of both the active and reserve components.

Agency Comments

In official oral comments on a draft of this report, DOD generally concurred with GAO's recommendations. DOD noted that it has determined that the trauma care training concept is feasible for general surgeons and is currently evaluating the concept for other military medical personnel. DOD further stated that it is addressing GAO's concerns. Specifically, it plans to (1) negotiate a new agreement with Sentara Norfolk General Hospital to provide trauma care training, (2) facilitate development of an evaluation tool to help assess the effectiveness of trauma care training and include other individual trauma care training programs beyond the demonstration program in its evaluation, and (3) establish panels to determine trauma care sustainment training needs for all military medical personnel and not only general surgeons. Finally, DOD stated that, in February 1998, the Combat Trauma Surgical Committee reconvened to coordinate with the services in developing, coordinating, and implementing trauma care training strategy for both the active and reserve components.

DOD also stated that it has specific concerns regarding (1) additional costs for licensure and credentialing of providers, (2) costs for additional civilian trauma training opportunities, and (3) sustainment costs of what will have to become a new readiness mission. GAO recognizes that cost is a factor that DOD must consider in selecting civilian training locations. GAO notes that the extent to which DOD might incur additional costs depends on the specific site selected.

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Abbreviations

CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
DOD	Department of Defense
GAO	General Accounting Office

Chapter 1

Introduction

Warfighters need to be confident that military medical personnel can take care of them if they are wounded on the battlefield. However, Gulf War reports pointed out that medical personnel were unprepared to provide combat casualty care. These reports questioned the Department of Defense's (DOD) ability to meet its wartime medical mission, particularly in providing care to the predicted number of casualties. A major area of concern was that many military medical personnel lacked sufficient training or experience in wartime skills, such as trauma care.

Few military medical personnel receive hands-on training for trauma care, which includes treating actual patients who have incurred severe injuries. Instead, most medical readiness training is provided through formal classroom instruction and field exercises. In peacetime, medical personnel have little chance to practice their battlefield trauma care skills because most patient care provided in military treatment facilities bears little resemblance to injuries treated in wartime. For example, the most common wounded-in-action injury is an open penetrating wound, whereas the most common peacetime diagnosis is a single live birth. In fact, none of the 50 most frequent peacetime diagnoses at military medical centers match a wounded-in-action condition. Appendix I describes the top five wounded-in-action injuries, nonbattlefield injuries, and diseases and the top five diagnoses seen in military treatment facilities in fiscal year 1997.

Gulf War Studies Highlighted the Need to Improve Trauma Care Training

DOD lessons learned after the Gulf War highlighted that many medical personnel had little to no experience in taking care of severely injured patients. For example, of the 16 surgeons on the Navy hospital ship USNS Mercy, only 2 had recent trauma surgical experience. Also, none of the over 100 corpsmen at a surgical support company had ever seen actual advanced trauma life support given to a trauma patient. In addition, an Army report highlighted that surgical teams identified to complement the rapid movement of troops during the war and provide emergency surgical services consisted of physicians who were not surgeons, such as obstetrician/gynecologists. An Army trauma surgeon deployed to the area believed that an obstetrician could not have provided lifesaving definitive surgery.

In 1992 and 1993, we issued reports on medical readiness weaknesses identified during the Gulf War.[1] These reports highlighted that some

[1]Operation Desert Storm: Problems With Air Force Medical Readiness (GAO/NSIAD-94-58, Dec. 30, 1993), Operation Desert Storm: Improvements Required in the Navy's Wartime Medical Program (GAO/NSIAD-93-189, July 28, 1993), and Operation Desert Storm: Full Army Medical Capability Not Achieved (GAO/NSIAD-92-175, Aug. 18, 1992).

medical personnel were not trained to take care of combat casualties. For example, although Navy nurses and physicians who were deployed to the war were described as experienced and competent, many of them had never treated trauma patients, and most had not completed training in combat casualty care. The prolonged buildup of forces over a 6-month period allowed Navy personnel to perform medical training, such as refresher resuscitative skills, mass casualty drills, and triage procedures. Also, one report noted that a slot for an Army thoracic (chest) surgeon was filled by a gynecologist who admitted that he was not qualified for the position because he had never opened a human chest cavity.

A July 1995 Congressional Budget Office report on restructuring military medical care, prepared at the request of the House Committee on National Security, indicated that the military services may need to establish affiliations with level I civilian trauma centers to improve wartime medical training and broaden exposure to wounded-in-action injuries. Level I centers provide total care for the most severely injured trauma patients.[2] Many injuries seen in these centers are similar to the injuries seen in war. Only 2 of DOD's 115 military hospitals are level I trauma centers. These centers are Brooke Army Medical Center and Wilford Hall Medical Center, both located in San Antonio, Texas.

In March 1995, Congress held hearings on DOD wartime and peacetime medical requirements, including medical readiness training weaknesses. In February 1996, Congress enacted the National Defense Authorization Act for Fiscal Year 1996 (P.L. 104-106). Section 744 of the act required that the Secretary of Defense implement a demonstration program to evaluate the feasibility of providing shock trauma training for military medical personnel in civilian hospitals.

Diverse Medical Teams Provide Wartime Trauma Care

DOD has about 100,000 active duty medical personnel, including general and other surgeons, nonsurgical physicians, physician assistants, nurses, and enlisted medical personnel. Various teams of these personnel provide medical care to wounded soldiers on the battlefield. The most critical time for treatment of severe battlefield trauma is within the first hour of injury. Historical data from past conflicts shows that medical treatment, including nonsurgical, makes a significant contribution to the decrease in loss of lives and limbs during this critical period.

[2]Level II through IV centers provide less comprehensive trauma care than a level I center.

Initial care of a wounded soldier is provided by self-aid or a fellow soldier administering first aid. The first medically trained team that responds to battlefield injuries—known as first responders—includes enlisted medical personnel, such as combat medics, field corpsmen, and independent duty corpsmen, and a physician assistant or a physician. These personnel move with the combat units they support and provide medical care limited to emergency procedures that prevent death, such as establishing an airway, controlling hemorrhaging, administering intravenous fluids, and stabilizing wounds and fractures.

Forward surgical teams, which consist of physicians (especially surgeons), nurses, and medical technicians, also provide care for those severely injured on the battlefield. These teams provide emergency surgical procedures that prevent death, loss of limb, or body function. The size of the team is determined by the predicted number and type of casualties.

Medical Personnel Receive Readiness Training

Military physicians must meet basic civilian education and residency requirements as well as military training requirements to provide medical care during wartime. After 4 years of medical school, physicians receive specialized training in graduate medical education or residency programs. Residents in a surgical specialty are required to perform a rotation in trauma and critical care to become board-certified general surgeons. This rotation provides the resident experience with hands-on management and treatment of severely injured trauma patients. Much of this trauma training occurs in civilian facilities because DOD has only two level I trauma centers that receive severe trauma patients. After physicians complete residency training, no formal DOD or service hands-on training program exists for sustaining trauma care skills. Although there is no requirement in the civilian sector for continuing hands-on experience, the American College of Surgeons suggests that surgeons treat about 50 severe trauma cases per year to remain adequately trained in trauma care.[3]

Enlisted medical personnel, such as combat medics and field corpsmen, receive initial medical readiness training in both basic military and life support skills. The military skills courses teach technical, tactical, and leadership training necessary for personnel to function as part of a medical team in a war environment, and the basic life support course teaches necessary medical skills. For example, the entry-level course for Army medics includes about 150 hours of classroom training devoted to

[3]The American College of Surgeons is a professional medical association founded in 1913 to improve the care of surgical patients and the education of surgeons.

basic emergency medical skills and a field exercise at the conclusion of the class. However, the medics do not receive hands-on trauma experience at a hospital or on board an ambulance.

Before deployment, both military physicians and enlisted medical personnel are required to take courses on combat casualty care, which focuses on the military casualty management system and casualty care in a battlefield environment. These courses consist of classroom instruction, animal laboratories, and field training and include the principles of trauma life support. These courses also do not provide hands-on exposure to actual trauma patients.

DOD Organizations Play a Role in Trauma Care

The Office of the Assistant Secretary of Defense for Health Affairs is responsible for the overall supervision of health and medical affairs within DOD. In addition to issuing policy, Health Affairs controls and monitors the services' medical readiness programs and resources, including medical training programs. Health Affairs has established a number of organizations to help oversee medical readiness. For example, in June 1996, Health Affairs formed the Defense Medical Readiness Training and Education Council, which is responsible for developing joint medical readiness training policy and overseeing the services' medical training programs, including trauma care.

In August 1996, Health Affairs organized the Combat Trauma Surgical Committee to study policy options for sustaining wartime trauma surgery capabilities. Current Committee members include trauma surgery representatives from each service, Reserve Affairs, the Uniformed Services University of the Health Sciences, the private sector, two military treatment facilities that have affiliations with civilian trauma centers, and DOD's two military trauma centers. In February 1997, the Committee issued a report recommending three categories of military trauma-trained surgeons and trauma training standards, which included both hands-on experience and continuing education. The service Surgeons General approved the recommendations, and in May 1997, the Acting Assistant Secretary of Defense for Health Affairs directed the services to develop phased implementation plans for training active duty personnel in trauma surgical skills.

The Surgeons General of the military services are responsible for policy development, direction, organization, and management of the health services system within their service. Each service has a medical

department that is responsible for providing medical readiness training (i.e., the Army Medical Command, the Navy Bureau of Medicine and Surgery, and the Air Force Medical Services). Each individual department trains its medical personnel for their missions. However, the unit commander is ultimately responsible for certifying that unit personnel have medical readiness training.

The Deputy Director for Medical Readiness Division in the Joint Staff Directorate for Logistics is responsible for reviewing medical portions of the commanders in chief's operation and contingency plans and Joint Strategic Planning System documents to assess the adequacy, feasibility, and suitability of medical plans, requirements, and resources. In 1997, the Division sponsored five seminars to identify medical capabilities, training issues, and technology needed to support future war-fighting missions through 2010. The seminars focused on the management of wartime casualties in theater, including the identification of core medical skills and the subsequent training requirements.

Objectives, Scope, and Methodology

Section 744 of the National Defense Authorization Act for Fiscal Year 1996 requires us to assess the effectiveness of DOD's demonstration program in providing shock trauma care training for military medical personnel through one or more public or nonprofit hospitals. Specifically, we (1) determined the status of the demonstration program and DOD's actions to meet the legislative provisions, (2) identified other initiatives aimed at training military personnel in trauma care, and (3) identified key issues that DOD should address if it decides to expand its trauma care training program.

To obtain background information on DOD medical readiness and trauma care training, we interviewed officials within many DOD and service components and reviewed DOD directives, policies, and guidelines. Our review focused on active component training because DOD focused the demonstration program and its initial efforts on the active duty component. In addition, active duty personnel provide most of the care in military treatment facilities. Nevertheless, reserve personnel play a major role in wartime medical care since they represent about 57 percent of all military medical personnel. Also, we reviewed DOD reports and studies on medical readiness training, DOD medical lessons learned reports from the Gulf War, and other related reports and congressional testimonies on military medical care. We examined military medical textbooks, medical

journals, and various other information sources for relevant data on trauma care.

To assess the effectiveness of DOD's demonstration program, we (1) monitored the implementation of the program by Naval Medical Center Portsmouth officials, (2) collected data on the program and the rotations through the civilian trauma center at Sentara Norfolk General Hospital, (3) interviewed the program's trainees and Navy trauma-trained surgeon and medical school officials, and (4) discussed legal issues regarding the program with Navy judge advocate officials from both the Naval Medical Center Portsmouth and the Navy Bureau of Medicine and Surgery.

To identify other initiatives aimed at providing military medical personnel training in trauma care and determine the key issues that DOD faces in providing military medical personnel training in wartime medical skills, we interviewed officials from Health Affairs, military treatment facilities that provide trauma care training or have training affiliations with civilian trauma centers, and private trauma centers. We also interviewed military medical personnel who trained in civilian trauma centers. In addition, we consulted with officials from a professional medical association affiliated with trauma care to learn their perspectives on military trauma care training. We did not evaluate the feasibility of increasing the number of military treatment facilities that receive trauma patients. However, DOD officials noted that a substantial investment would be required to upgrade a military treatment facility to a level I trauma center. Appendix II lists all the federal, state, and private organizations we contacted.

We conducted our review from April 1997 to February 1998 in accordance with generally accepted government auditing standards.

Chapter 2

DOD's Demonstration Program Proceeds at a Slow Pace

Section 744 of the National Defense Authorization Act for 1996 mandated the establishment of DOD's demonstration program to evaluate the feasibility of providing shock trauma training to military medical personnel in one or more public or nonprofit hospitals. However, the program does not fully meet all of the requirements of the mandate. Further, the program will only have been in effect for 5 months, as of April 1, 1998, and thus will need to be further developed before its effectiveness can be fully determined.

Legislative Mandate Provides Reporting Requirements

Section 744 of the National Defense Authorization Act for Fiscal Year 1996 (P.L. 104-106, Feb. 10, 1996) requires DOD to implement a demonstration program by April 1, 1996, to evaluate the feasibility of providing shock trauma training for military medical personnel through one or more public or nonprofit hospitals. The law also requires DOD to report on the status of the demonstration program by March 1, 1997, and March 1, 1998, and us to comment on the program's effectiveness by May 1, 1998. Finally, the law requires that agreements with hospitals include a provision that the hospitals provide health care services to DOD beneficiaries that are at least equal to the value of the services provided by the military personnel training at the hospitals.

Navy Designated to Lead DOD's Demonstration Program

In April 1996, Health Affairs requested input from the services on existing programs that could be used for the demonstration program to train military general surgeons in a civilian trauma center. In April 1997, Health Affairs designated Naval Medical Center Portsmouth in Virginia as the site for the demonstration program because of its affiliation with Sentara Norfolk General Hospital—a local trauma center—and Eastern Virginia Medical School. This affiliation had consisted of Navy general surgery residents training at the local trauma center and two Navy trauma-trained surgeons on call at the civilian trauma center about 3 to 4 nights per month. In addition, a Navy surgeon at Portsmouth had been involved in the Combat Trauma Surgical Committee, which established the standards for trauma surgery sustainment training. No other sites were proposed by the Navy.

According to Health Affairs and service officials, other sites were informally suggested but were deemed unacceptable because they were either military treatment facilities, instead of civilian centers, or graduate medical education programs, instead of sustainment training programs. Other suggestions had limitations. For example, the Army initially

suggested a trauma sustainment program based in Georgia but then did not support it because the surgeon in charge of the program was deployed to Bosnia for a year. The Air Force suggested Ben Taub General Hospital in Houston; however, its current program for general surgeons only consists of observation and no hands-on experience. Because of the limitations of these and other possibilities, Health Affairs requested that the Naval Medical Center Portsmouth conduct the DOD demonstration program. In October 1997, the medical center signed an agreement with Eastern Virginia Medical School to obtain sustainment trauma training for Navy general surgeons at Sentara Norfolk General Hospital. The first rotation began in November 1997.

Sentara Norfolk General Hospital, a nonprofit hospital, is the only level I trauma center located in Norfolk, Virginia. It is also the primary teaching hospital for Eastern Virginia Medical School. The hospital is a 664-bed facility located on a large medical complex that includes Eastern Virginia Medical School and a children's hospital. In 1996, Sentara's trauma center saw 2,060 trauma and burn patients. The hospital is also part of a larger regional health management organization, Sentara Health System, which currently holds the DOD contract for TRICARE through which approximately 40,000 enrollees eligible for the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) receive health care services.

Eastern Virginia Medical School is a private school that does not own a hospital but provides human resources to Sentara Norfolk General Hospital and other hospitals in the area. The school has nearly 600 students in its degree programs as well as 300 residents and fellows and 300 faculty members. The surgery staff at Eastern Virginia Medical School currently provides and directs trauma services at Sentara Norfolk General Hospital. General surgery residents from Eastern Virginia Medical School and Naval Medical Center Portsmouth also rotate at Sentara Norfolk General Hospital for trauma care experience.

Naval Medical Center Portsmouth is a 360-bed facility that provides medical services to active duty Navy, Marine Corps, Army, Air Force, and Coast Guard personnel; their families; and other DOD beneficiaries. The medical center is one of three major teaching hospitals in the Navy with residency programs, including general surgery.

The head of the Department of General Surgery at Naval Medical Center Portsmouth has specific responsibility for the demonstration program. Under the program, a general surgeon from the medical center performs a

3-week rotation at Sentara Norfolk General Hospital. The Portsmouth official in charge of the program said that the program is operated at no cost to the government because the hospital is within commuting distance of the medical center. In addition, the Portsmouth official said the absence of a surgeon from the medical center does not affect the center's patient workload because the general surgery department is well staffed.

During the rotation, a Navy general surgeon is to be on call every other night at Sentara Norfolk General Hospital and, when possible, under the supervision of a Navy trauma-trained surgeon. Currently, Naval Medical Center Portsmouth has only one trauma-trained surgeon who is to be on call at the hospital 3 to 4 nights a month. On the remaining nights, the Navy trainee is to be under the direction of a civilian attending physician. The trainee is to function as a trauma team leader and be responsible for assessing patients and developing therapeutic and diagnostic plans. The trainee is to receive hands-on experience in caring for trauma patients, including stabilizing and resuscitating the patient by (1) inserting intravenous lines for fluids, chest tubes for air in the chest cavity, or endotracheal tubes for airway management and (2) performing surgery if necessary. The trainee is also responsible for the management of the patients after they leave the trauma room and enter the intensive care unit.

Program Implementation Is Not Fully Consistent With Legislative Provisions

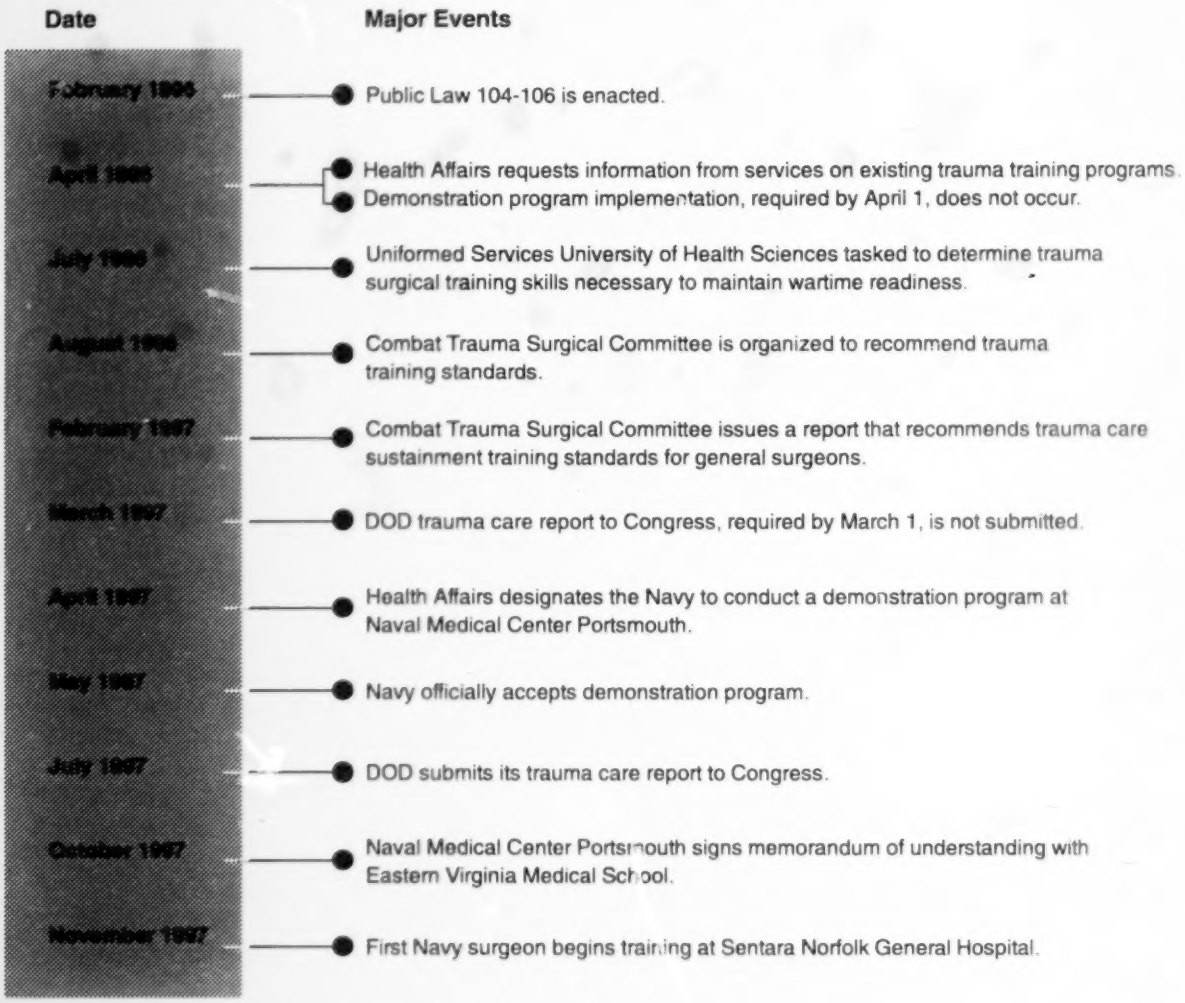
DOD's implementation of the demonstration program does not fully meet the legislative provisions authorizing the program for two reasons. First, the program did not meet the congressionally mandated schedule. Second, the program agreement does not include a provision that the civilian center provide health care services to DOD beneficiaries that are at least equal to the value of the services provided by military personnel training in the center.

Demonstration Program Is Behind Mandated Schedule

Public Law 104-106 directed DOD to implement its demonstration program by April 1, 1996. However, DOD did not implement the program at Sentara Norfolk General Hospital until November 1997. The law also specified that DOD report to Congress on the scope and activities of the demonstration program by March 1, 1997, and March 1, 1998. DOD issued its first report to Congress on July 24, 1997. The report describes the activities leading up to identifying the requirements for peacetime training of military surgeons, describes the demonstration site, and states that DOD would monitor other trauma training programs in military treatment facilities and with civilian centers. DOD's second report, due March 1, 1998, had not been issued as of

March 13, 1998. Figure 2.1 shows a timeline of major events from enactment of the law to the actual start of the demonstration program.

Figure 2.1: Timeline of Major Events for Public Law 104-106


Date
Major Events
February 1996
Public Law 104-106 is enacted.
April 1996
Health Affairs requests information from services on existing trauma training programs.
Demonstration program implementation, required by April 1, does not occur.
July 1996
Uniformed Services University of Health Sciences tasked to determine trauma surgical training skills necessary to maintain wartime readiness.
August 1996
Combat Trauma Surgical Committee is organized to recommend trauma training standards.
February 1997
Combat Trauma Surgical Committee issues a report that recommends trauma care sustainment training standards for general surgeons.
March 1997
DOD trauma care report to Congress, required by March 1, is not submitted.
April 1997
Health Affairs designates the Navy to conduct a demonstration program at Naval Medical Center Portsmouth.
May 1997
Navy officially accepts demonstration program.
July 1997
DOD submits its trauma care report to Congress.
October 1997
Naval Medical Center Portsmouth signs memorandum of understanding with Eastern Virginia Medical School.
November 1997
First Navy surgeon begins training at Sentara Norfolk General Hospital.

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DOD officials cited four main reasons for the delay in implementing the program. First, Health Affairs officials explained that the delay was partly due to shifting responsibility for the program between its offices. The program started in the Clinical Services office because Health Affairs thought trauma care training was a peacetime training issue. When Health Affairs realized that trauma care training was actually a wartime medical readiness training issue, it transferred responsibility for the program to its Health Services Operations and Readiness office.

Second, Health Affairs was examining whether it could use in-house trauma training programs at DOD's two trauma centers—Brooke Army Medical Center and Wilford Hall Medical Center—to fulfill the legislative mandate. The officials stated that these two military centers could train the whole trauma team and not just general surgeons. However, Health Affairs realized that this training would not meet the requirement of the law because the training would not take place in civilian trauma centers. In addition, according to Brooke and Wilford Hall officials, their military centers do not have the trauma volume to train military personnel that are not already permanently assigned there.

Third, Health Affairs officials wanted to determine minimum training standards for general surgeons before the start of the program. According to DOD officials, consensus on the minimum number of cases and the amount of time needed in training was difficult to reach. Agreeing and publishing DOD's recommendation for the minimum training standards for trauma surgery took from August 1996, when the Combat Trauma Surgical Committee was convened, to February 1997. According to a Committee official, consensus took a long time because (1) no civilian standards existed on how many cases per year a surgeon needs to manage to be adequately trained in trauma and (2) the length of training that is both reasonable and doable was difficult to determine, given DOD's conflicting medical missions.

Finally, DOD did not want the implementation of the demonstration program to interfere with other Naval Medical Center Portsmouth trauma training at the civilian center. Specifically, from May to October of each year, senior surgical residents from Naval Medical Center Portsmouth train for 3 months at Sentara Norfolk General Hospital. During this rotation, the surgical residents function as trauma team leaders. The official responsible for the demonstration program did not want to send general surgeons for sustainment training at the hospital at the same time

as senior surgical resident training because the number of cases that could be managed by each group would be lessened.

The Deputy Assistant Secretary of Defense for Health Services Operations and Readiness was not concerned about the late implementation of the demonstration program because he believed that 6 months would be adequate to determine the feasibility of training surgeons in a civilian trauma center. Other service officials stated that they were not concerned with the implementation deadline. These officials believed that it was more important to take the necessary time to design the program correctly rather than implement a program quickly just to meet the target date specified in the legislation.

Demonstration Program Does Not Include an Exchange of Equal Value of Services

The agreement between Naval Medical Center Portsmouth and Eastern Virginia Medical School does not include an exchange of equal-value services, as required by the law. Specifically, the law states that an agreement shall require that the value of the services provided by a hospital to members of the armed forces and other DOD beneficiaries should be at least equal to the value of the services provided by military medical personnel under the agreement.

The Navy did not propose equal value of services in its negotiations with Eastern Virginia Medical School. The official at Naval Medical Center Portsmouth that is responsible for the demonstration program believed that, if he had asked for this arrangement, the program would not have been initiated. Health Affairs officials said that they instructed Navy officials to try to meet the conditions of the law but not to allow negotiations on in-kind services to prevent the program from being implemented. In addition, officials believed that the value of the services provided by the military trainees was offset by the value of the training provided by the medical school. Eastern Virginia Medical School officials told us that an in-kind services arrangement would not be acceptable because neither the school nor the hospital receives any significant financial benefit from this arrangement. Officials also stated that the Navy surgeon trainee is used as additional staff and does not reduce the medical school's staffing. Further, medical school officials stated that, if the Navy had insisted on such an arrangement, the demonstration program at Sentara would not have been acceptable.

We discussed the possibility of in-kind service arrangements with trauma officials from four large level I trauma centers that provide training to

military medical personnel. Officials from two of the centers stated that their hospital would be willing to consider an in-kind service arrangement with DOD, especially if DOD included a military trauma-trained surgeon as an attending physician. One of these centers currently provides room and board to its military trainees. The other center is in the process of negotiating an agreement in which 20 military trainees would receive room and board. Officials from the other two centers stated that their facilities would not consider providing in-kind services.

Effectiveness of Program Is Not Yet Known

It is still too early to determine the effectiveness of the demonstration program in training medical personnel in trauma care. The program at Sentara is limited to general surgeons, and only a few surgeons have rotated through the program. Also, not enough data has been collected: a training evaluation tool had not been completed as of January 1998, and an interim data collection instrument captures very little data. In addition, although the site chosen for the demonstration program provides valuable training, it does not offer the volume of penetrating trauma cases other urban centers may have afforded.

Program Is Limited to General Surgeons

Although DOD's demonstration program is to evaluate the feasibility of training military medical personnel in public or nonprofit hospitals, the program has provided training thus far only to general surgeons. The program currently does not include training other military medical personnel who are expected to be the first to treat combat casualties, such as combat medics, corpsmen, and general medical officers. Health Affairs officials acknowledged that personnel other than general surgeons need trauma care training but stated that the training started with the surgeons because they are considered the trauma leaders. The officials also believed that civilian hospitals would more readily accept general surgeons because of their credentials and licenses. In addition, DOD already had numerous affiliations with civilian hospitals to provide graduate medical education to military physicians. An official at Eastern Virginia Medical School indicated that the DOD demonstration program could be expanded to include personnel other than general surgeons. The official noted that the school currently has physician assistant and surgical assistant training programs that could incorporate training for military corpsmen.

Although the demonstration program has been limited to training general surgeons, we found a number of unrelated programs that are training medics and corpsmen in civilian trauma centers. For example, the Third

Marine Aircraft Wing in California trains corpsmen and general medical officers at a level I trauma center in southern Los Angeles County. Likewise, Army Special Operations Forces enlisted medical personnel train at three civilian facilities located in Maryland, Colorado, and New Mexico. The Army is also negotiating with a level I civilian trauma center in Texas to provide training to a forward surgical team made up of general surgeons, orthopedic surgeons, anesthesiologists, nurses, and medics.

Few Rotations Have Taken Place

Only four surgeons will have completed their training rotations by the March 1, 1998, congressional reporting date. The first trainee began his 3-week rotation in November 1997 and saw a total of 65 cases, including 50 blunt trauma, 5 gunshot wounds, 3 stabbings, and 7 other injuries.[4] Of the total number of cases, 20, or 31 percent, were categorized as severe. The trainee performed surgery for six cases, including three penetrating trauma cases. The five gunshot wounds and the three stab wounds are penetrating injuries and are therefore similar to the type of combat casualties that are expected on the battlefield. These penetrating trauma cases represented 12 percent of the total number of cases.

As of January 1998, the Portsmouth official responsible for the demonstration program stated that the feasibility of training military surgeons in a civilian trauma center had been shown. However, he believed that it would probably be another 6 months to 1 year, as additional trainees rotate through the program, before the effectiveness of the program could be determined. The trauma-trained surgeon and the first two Navy trainees, who all had prior deployment experience in the Gulf War, acknowledged that the training at Sentara Norfolk General Hospital provided them with recent experience in treating trauma. Although the surgeon and trainees reserved judgment on the overall effectiveness of the program, they believed that the program built their confidence level in treating severely injured patients.

Evaluation Tool Has Not Been Completed

Naval Medical Center Portsmouth and Eastern Virginia Medical School have been developing a training evaluation tool. This tool is expected to capture data on the number and type of injuries managed and the procedures performed. The Portsmouth official in charge of the demonstration program has the responsibility for developing the evaluation tool, but no administrative support personnel have been provided to assist with the official's additional duty.

[4]As of January 27, 1998, data was only available for one trainee.

As of January 1998, the evaluation tool had not been completed, and the Portsmouth official did not know when it would be completed because of other competing demands. In the interim, the official has been collecting data on the number and types of cases managed by the trainees and working on a database to compile this information along with the procedures performed by the trainees. The official is also working on a subjective questionnaire for trainees who have completed the program. This questionnaire is to capture the trainees' trauma experience level before they began their rotation and assess the adequacy of the training they received at Sentara Norfolk General Hospital.

DOD Did Not Consider the Amount of Warlike Injuries When Selecting the Demonstration Site

According to an official in Clinical Services, Health Affairs did not establish criteria for selecting a site for the demonstration program other than identifying already established military trauma training programs with civilian trauma centers. Health Affairs did not consider the amount of penetrating trauma cases that these centers typically see. As a result, it is not clear whether the site selected for the demonstration program will provide as many penetrating trauma cases as other potential sites. About 90 percent of battlefield trauma is penetrating (e.g., bullets from small arms and fragments from explosive munitions).

Although criteria for site selection was not established when Naval Medical Center Portsmouth was chosen, DOD and civilian trauma officials told us that trauma centers that receive more than 2,500 trauma cases per year, with at least 30 percent from penetrating trauma, would provide the most hands-on exposure to warlike injuries. In addition, these officials and representatives of the American College of Surgeons' Committee on Trauma stated that an ideal trauma center would also be associated with an academic center to show a commitment to trauma education, training, and research. Trauma centers that frequently meet these criteria are large inner-city level I centers whose personnel are frequently strained by the large number of trauma cases. One DOD official believed that the civilian center's proximity to a military hospital and the presence of reserve or retired military personnel at the civilian center should also be a factor in selecting a site.

Sentara Norfolk General Hospital is a level I trauma center, associated with a medical school, located within close proximity to a military hospital, and staffed with active and retired military personnel. However, the trauma center does not have the volume of penetrating trauma cases as some other civilian level I trauma centers that train military medical

personnel. Sentara had less than 400 penetrating trauma cases in 1996, but other trauma centers that train military medical personnel had about 900 to 1,200 cases of penetrating trauma per year. For example, Martin Luther King, Jr./Drew Medical Center received 1,188 cases of penetrating trauma in 1996.

Individual Programs Attempt to Satisfy Wartime Trauma Training Needs

Before the DOD demonstration program in November 1997, no overall DOD or servicewide program existed to provide hands-on experience in treating trauma patients. A number of individual programs have been established with civilian trauma centers to fill the void left by the lack of DOD training programs for trauma care. These individual programs generally involve affiliations between physicians, military medical facilities, or combat units and local civilian trauma centers. However, since the programs are mostly local and based on personal initiatives within the individual services, they are sometimes short-lived. The collective experiences of these programs, coupled with those of the demonstration program, could provide DOD valuable information in determining the feasibility and effectiveness of training military medical personnel in civilian trauma centers. Finally, although DOD operates two level I trauma centers, sustainment training at these centers is limited.

Individual Programs Establish Affiliations With Civilian Centers for Trauma Training

Because of the lack of DOD or servicewide programs for sustainment trauma care training, a number of individual programs have been established to provide such training. Table 3.1 lists the individual trauma care training programs that we identified, followed by program descriptions. All of the programs, except one, have been limited to military medical personnel from a single service. The program at Ben Taub General Hospital in Houston, Texas, plans to include military medical personnel from all three services. Because individual programs are based on personal initiatives, neither DOD nor the services maintain a central clearing point or database of trauma training programs. Thus, there may be additional local trauma care training programs beyond those that we identified.

Table 3.1: Individual Military Trauma Training Programs in Civilian Facilities

Program	Location	Type of personnel trained	Status
Regional Trauma Network	Atlanta, Augusta, and Savannah, Georgia; Baltimore, Maryland; and Nashville, Tennessee	General and orthopedic surgeons	Inactive
Military surgical teams at Ben Taub General Hospital	Houston, Texas	Surgeons, other physicians, nurses, and medics	Planned
Third Marine Aircraft Wing at Martin Luther King, Jr./Drew Medical Center	Los Angeles, California	Corpsmen and medical officers	Active
Third Marine Aircraft Wing at Santa Ana Fire Department	Santa Ana, California	Corpsmen and medical officers	Active
First Marine Division at Scripps Hospital	San Diego, California	Corpsmen	Planned
Naval Medical Center San Diego at Mercy Hospital	San Diego, California	General surgeons	Suspended
Naval Hospital Oakland	Oakland, California	General surgeons	Canceled
Army Special Operations at civilian centers	Denver, Colorado; Gallup, New Mexico; and Baltimore, Maryland	Medics	Active

Army Programs

The first of two Army programs that train military medical personnel in civilian trauma centers is the Regional Trauma Network. In 1993, Dwight David Eisenhower Army Medical Center in Augusta, Georgia, initiated a trauma training program for Army general and orthopedic surgeons in the Southeast Regional Medical Command. The Chief of Trauma and Surgical Critical Care at the center started this program because of the unavailability of sustainment trauma training in most military treatment facilities. Implementation of the program began in 1993 and was not completed until 1996 because of the lack of local command support for the program and funding for temporary duty and travel costs. Funding was ultimately obtained from the Army Surgeon General.

This program was intended to give surgeons hands-on experience in managing and treating critically injured trauma patients in one of five level I trauma centers. From January to September 1996, seven surgeons trained in the five different trauma centers for 30 days, including two

surgeons from deployments in Bosnia and Hungary. The cost for the seven surgeons was less than $19,000, or about $2,665 per surgeon.[1] Many participants stated that the training renewed their confidence for treating seriously wounded patients.

Between September 1996 and January 1998, only one surgeon rotated through the program. This rotation occurred in October 1997 at no cost to the military because the surgeon was stationed within commuting distance of the civilian trauma center. According to the surgeon in charge of the program, no additional rotations have occurred mainly due to insufficient funding for the trauma training and not the lack of available slots at the civilian centers or the lack of military volunteers. The surgeon intends to begin rotating a surgeon through a civilian center in April 1998.

The second program, which is still in the planning stages, is at Ben Taub General Hospital in Houston, Texas. The hospital's level I trauma center receives approximately 2,800 trauma cases per year, including about 900 penetrating injuries. Since November 1997, the Army has been negotiating with officials from the hospital to rotate forward surgical teams through the trauma center. The teams consist of three general surgeons, one orthopedic surgeon, two nurse anesthetists, one critical care nurse, one operating room nurse, one emergency room nurse, three licensed vocational nurses, three operating room technicians, four emergency medical technicians (medics), and one administrator. The team also includes a military trauma surgeon who would be given attending privileges at the hospital and would coordinate and monitor the training.

Currently, two 30-day rotations are planned. An Army surgical team will rotate through the center in April 1998 and an Air Force team in May 1998. In addition, a Navy surgical team may rotate through the center in June 1998. The Army, along with the Defense Medical Readiness Training Institute, plans to develop an evaluation tool to capture travel costs, opportunity costs (decreased patient workload at a military treatment facility), and the benefits of training in a civilian trauma center.

According to an Army official, the Great Plains Army Medical Command will provide funding for travel and any licensing fees for the Army team. The physicians are not required to have a Texas license and can train under the hospital's institutional permit, which costs $50 per physician.

[1]One surgeon commuted less than 2 miles to a civilian center at no cost, but the travel and temporary duty costs for the surgeon from Hungary totaled $4,600.

The nurses will need a current Texas nursing license, which costs between $75 and $90. The hospital will provide room and board for the teams.

Marine Corps Programs

In May 1997, the Third Marine Aircraft Wing at El Toro, California, established a trauma training agreement with Martin Luther King, Jr./Drew Medical Center in south Los Angeles. The hospital has a level I trauma center that receives approximately 2,500 trauma cases per year. Under the agreement, a Navy general medical officer and two hospital corpsmen, all from the same squadron, will train for 30 days on one of the center's trauma teams.[2]

The first team completed its training in June 1997, and one team per month was expected to train at the center through March 1998. The program has been operating at no cost to the government. The trainees pay their own travel expenses to and from the center, and the center provides free housing, meals, and parking for the trainees.

The trainees complete after-action reports detailing their training experience. According to these reports and interviews with the trainees, their confidence and skill levels in trauma care improved because of the training. For example, one rotation of trainees saw an average of two gunshot wounds per night, and in one night six gunshot wound victims arrived at the center. Under the direct supervision of the attending physician or senior surgical resident, the corpsmen were allowed to perform procedures, such as initial assessments of trauma patients for injuries, intubations, chest tube placements, central line placements, suture lacerations, and removal of bullets lodged under the skin.

Before the rotations, the corpsmen stated that their duties in military treatment facilities did not include treating trauma patients. One corpsman said that he never saw trauma patients while working in the emergency department at the Naval Medial Center San Diego. His duties consisted of drawing blood and starting simple intravenous lines. All of the corpsmen stated that they had attended classroom training and field exercises on how to treat combat casualties but had not performed hands-on procedures with actual patients.

Because of the aircraft wing's experience at the civilian trauma center, officials at the First Marine Division at Camp Pendleton, California, are negotiating with Scripps Memorial Hospital, a local level I trauma center in

[2]Navy medical personnel provide health care services for the Marine Corps.

San Diego, to provide trauma training for their corpsmen. According to the Deputy Commander of the I Marine Expeditionary Force, if the trauma training program is a success, the Force will consider expanding the training to the medical personnel in the support group, which includes the medical battalions and surgical teams.

Third Marine Aircraft Wing officials also negotiated an agreement with the Santa Ana Fire Department to provide prehospital trauma training experience. Corpsmen and general medical officers rotate with the ambulance service for 30 days and act as emergency medical technicians. During one rotation, a corpsman started numerous intravenous lines, treated one person with severe burns over 60 percent of his body, evaluated and treated gunshot patients from a multiple shooting, and practiced spine stabilization procedures. The corpsman stated that he was able to practice invaluable skills and refresh old training with hands-on experience in an unusual, nonclinical, and unpredictable environment, which will allow him to perform more efficiently in a combat scenario.

Navy Programs

According to a Navy trauma-trained surgeon, five or six Navy surgeons from the Oakland Naval Hospital obtained trauma sustainment training at Highland General Hospital, Oakland, California, from 1991 to 1995. Under this program, a Navy trauma-trained surgeon was assigned for 2 years as the medical center's Director of Trauma. Navy surgeons performed 30- to 90-day rotations as attending surgeons, with the trauma-trained surgeon backing them up.

According to the trauma-trained surgeon, the lack of experience of the surgeons deployed to the Gulf War was a major factor that allowed him to convince the naval hospital of the need for this training. In January 1992, the general surgery specialty advisor for the Navy recommended that a similar program be set up at all four Navy teaching hospitals. However, when Oakland Naval Hospital was closed, the program was discontinued.

According to Naval Medical Center San Diego officials, seven surgeons from the Naval Medical Center San Diego received trauma sustainment training at Mercy Hospital and Medical Center, also in San Diego, between 1992 and 1995. Five of these surgeons trained for 1 month, and two surgeons trained for 2 months. The current chairman of the general surgery department at the Navy medical center, appointed in the spring of 1995, has been hesitant to reestablish the program. He believes that, before

the program can be restarted a curriculum should be developed for the training and all general surgeons should be required to obtain this training.

The commander of the Navy medical center does not want to implement the agreement with Mercy Hospital and Medical Center because Mercy Hospital requires each Navy surgeon to obtain a current California medical license, even if the surgeon is licensed in another state. Military physicians who are training in civilian facilities in California are not required to have an active state medical license; they are only required to register with the state. Registration is done at no cost to the physician, whereas a California medical license can cost between $1,100 and $1,200. The Navy commander believes that, if this training is going to be required, DOD should pay for his staff to obtain a California medical license.

Army Special Operations Command Programs

Enlisted medical personnel in the Army Special Operations Command have been obtaining trauma sustainment training at the R. Adams Cowley Shock Trauma Center in Baltimore since 1989. The Command also has sustainment training agreements with Gallup Indian Medical Center in New Mexico and Denver General Hospital in Colorado. In addition, personnel obtain training at Brooke Army Medical Center and Wilford Hall Medical Center in San Antonio, Texas.

From October 1995 to April 1997, 61 Army enlisted medical personnel within the Command trained at the 5 centers at a cost of about $157,000, which includes airfare, rental car, lodging, and meals. After-action reports from some trainees indicated that the training provided the hands-on experience they needed to be confident that they could care for injured soldiers. For example, one trainee stated that he was able to see and do things that he had only read and studied about in classroom training and while working in a military treatment facility.

In April 1997, the Special Operations Command required all its enlisted medical personnel from the Army, the Navy, and the Air Force to become National Registry Emergency Medical Technician Paramedic trained and certified.[3] As a result, sustainment training for the Army enlisted medical personnel at the three civilian centers was temporarily put on hold while resources were focused on getting all medical personnel certified. Sustainment training resumed in September 1997.

[3]The Special Operations Command is the headquarters command for the three services' special forces.

Sustainment Training in DOD Trauma Centers Is Limited

Through a unique relationship with the city of San Antonio, Texas, the Army and the Air Force operate level I trauma centers at their medical centers in the city. This affiliation allows civilian trauma patients to be brought to these military hospitals for care.

Brooke Army Medical Center at Fort Sam Houston receives about one-third of the city's trauma patients. The center has been providing trauma care for about 15 years and receives about 800 admissions per year, 25 percent of which are penetrating trauma wounds. Wilford Hall Medical Center at Lackland Air Force Base also receives about 800 cases per year, about 20 percent of which are penetrating trauma.

DOD and service officials believe that these centers offer an advantage over civilian trauma centers because they can train military surgeons and the rest of the military trauma team, including other types of physicians, nurses, and enlisted medical personnel. However, officials at the centers stated that their low volume of trauma admissions and their current staffing levels preclude them from providing sustainment training for military medical personnel not already assigned to the centers. The current physicians, residents, interns, and fellows are already competing for limited hands-on trauma experiences. Medical personnel from the Army Special Operations Command confirmed that they received little hands-on training at Brooke and Wilford Hall compared with other civilian centers because the military facilities did not have enough trauma patients for the military staff already assigned there.

In addition, the city of El Paso, Texas, and the county-owned public hospital there have invited William Beaumont Army Medical Center, also in El Paso, to participate in a formal citywide trauma system. This system would require that the medical center become a level I trauma center. Currently, the center assists the community with civilian emergency support and receives about 500 of the 2,000 trauma injuries per year in the El Paso area.

The Army Surgeon General views the citywide trauma care system as an opportunity to train surgical teams in trauma management. However, an official at William Beaumont stated that, even with a level I designation, the center cannot train military medical personnel beyond those already assigned there because of the limited number of trauma patients the center can receive. However, with additional funding of about $2.7 million for start-up costs and annual funding of about $1.4 million, the official believes that the center could be expanded to accept more trauma patients

and therefore could train an additional 330 military medical personnel per year in trauma.

DOD Faces Challenges in Providing Trauma Care Training

DOD's demonstration program, along with individual efforts, are yielding lessons learned that could be useful in evaluating the concept of military-civilian cooperation in trauma care training. Several issues that may pose difficulties in providing such training have been identified but can be overcome. These issues include (1) military physician licensure requirements, (2) the capacity of civilian trauma centers to train large numbers of military personnel, and (3) concerns that military participation might detract from training civilian or other military medical graduates in civilian centers.

If DOD decides to expand its trauma care training, it will need to build on the Combat Trauma Surgical Committee's report and develop an overall strategy for wartime training capabilities. Fundamental preliminary steps for DOD to take to achieve these goals are completing the ongoing assessment of wartime medical requirements and determining which personnel will require trauma care training. Other important DOD actions include prioritizing the personnel requiring the training, determining the frequency of refresher training, and devising a means to track trained personnel. However, the biggest challenge DOD may face is determining how best to meet the competing demands within its health care system, which will require balancing the need for providing wartime medical readiness training with the need to deliver peacetime health care services.

State Licensure Has Not Been a Significant Obstacle

In the United States, physicians must generally be licensed in each state where they practice to protect the health, safety, and welfare of the public. Each state has its own laws and regulations that govern the practice of medicine. Therefore, each state can determine the requirements that DOD must follow to train its medical personnel in civilian trauma centers. In addition, individual trauma centers can require military trainees to meet the center's requirements, which may be more stringent than the state's, as part of its contractual agreement with the military.

Licensing is generally not an issue for military physicians practicing in military health care facilities. Under 10 U.S.C. 1094, military health care professionals who treat patients in military health care facilities are required to be licensed in only one state, which does not have to be the state where they are practicing.

State licensure has not been an issue in most of the programs we identified. In certain circumstances, state licensing agencies may issue limited or temporary licenses or certificates for finite periods of time to

health care professionals licensed in another state. In our review of six programs located in five states, only one of the states—Georgia—requires that the military physicians training in a civilian trauma center have a current state license. According to Georgia's Professional Examining Board, the state does not have a trainee license or any law that would allow military physicians to practice in a civilian facility without a current license.[1] The other four states only require registration, an institutional permit, or a trainee license. For example, California generally requires that military physicians register with the state before starting a training program in a civilian facility. Registration involves completing a one-page form at no cost.

Some civilian centers accept registration or a training license, but other centers required a current state license. Although the Medical Board of California only requires military physicians to be registered with the state, surgeons from Naval Medical Center San Diego who trained at Mercy Hospital and Medical Center were required by the center to have a current California medical license. Because participation in the program was voluntary and many of the Naval Medical Center's surgeons were already licensed in California, this requirement was not a problem. However, if training in the civilian centers becomes mandatory, then obtaining a license could become an issue because of the time and money to obtain a license. For example, obtaining a license in California takes about 45 to 90 days and costs about $1,100 to $1,200. Many military physicians we spoke with stated that DOD will not pay for obtaining this second license. In fact, DOD's July 1997 mandated report to Congress stated that, if civilian facilities require state licenses, DOD might need to make provisions for reimbursement for that additional license.[2]

[1]Civilian centers may have specific bylaw requirements for physician credentialing beyond just state licensure that might be a potential obstacle to training in the hospital.

[2]Under 10 U.S.C. 1096(d), DOD may reimburse military personnel up to $500 of the cost of a second license where it is required in order for the member to treat certain military members, retirees, dependents, and survivors at civilian facilities. Section 737 of the National Defense Authorization Act for Fiscal Year 1998 (P.L. 105-85, Nov. 18, 1997) authorizes licensed military health care professionals performing authorized duties for DOD to practice in any state whether the practice occurs in a DOD facility, DOD-affiliated civilian facility, or any other location designated by the Secretary of Defense. DOD has not evaluated the applicability of this provision to the section 744 trauma care training program and its impact on the provisions of 10 U.S.C. 1096 (d).

Trainee Competition With Other In-house Programs Could Limit Hands-on Experience

Competing with other in-house training programs in the civilian centers can limit the opportunities for military medical personnel to obtain hands-on trauma experience. Civilian hospitals that can offer the military the most beneficial training are generally teaching hospitals with level I trauma centers. However, these hospitals have internship, residency, and fellowship programs that train civilian physicians in trauma care; thus, the military trainees may have to compete with these students for hands-on experience.

DOD can overcome this issue by arranging for training to occur in high-volume, understaffed level I trauma centers. According to DOD and private sector officials, about 12 to 15 inner-city trauma centers have a very high volume of trauma cases that frequently strain or exceed personnel resources. Each of these centers, which are geographically dispersed, treat about 2,000 to 3,000 severe trauma cases per year. Therefore, these centers would provide more opportunities for military trainees to obtain hands-on experience.

The Third Marine Aircraft Wing's trauma training program sends its medical personnel to Martin Luther King, Jr./Drew Medical Center, an inner-city trauma center in south Los Angeles. The center is frequently understaffed for the over 2,500 trauma patients it receives each year. In addition, almost 50 percent of the injuries at this civilian center were penetrating trauma, including 32 percent from gunshot wounds. According to the center's director, the center has more than enough trauma cases for all of its civilian and military trainees because the military trainees augment the civilian members of the trauma team and do not replace staff. However, the additional staff allows the attending and senior residents to step back and teach decision-making and procedural skills rather than do the procedures themselves. The military trainees we spoke with stated that, during their 30-day rotation, there were more than enough training opportunities for all of the military and civilian trainees.

No Strategy Exists for Providing Trauma Care Training

DOD does not have a long-term strategy for providing trauma care training. If DOD decides to develop such a strategy, several issues warrant consideration, including the training needs of the reserve component, capacity of civilian centers to train military personnel, and the need for a system to identify trained personnel.

Committee Report Did Not Include Reserve Component

Although the Combat Trauma Surgical Committee's February 1997 report on policy options for DOD is a commendable beginning for identifying DOD's trauma care training needs, DOD does not have a long-term strategy with clear goals, objectives, and milestones to achieve the Committee's recommendations. Moreover, the report did not address the needs of the reserve component. The Assistant Secretary of Defense for Reserve Affairs was concerned with the report's lack of references to the reserves. The report noted that the reserve component is an integral part of the military health system and a critical asset in U.S. wartime capability.

The Committee made several recommendations regarding sustainment training of wartime surgical capabilities, resulting in the establishment of minimum readiness training standards for general surgeons. The report defined three categories of surgeons, which are distinguished by different levels of training and experience, and the required trauma care training for each category. The services are to propose the required and available number of general surgeons in each of the three categories and identify potential training programs at civilian trauma care centers. As of January 1998, the services' plans were incomplete. Further, no strategy is in place to coordinate the development of combat surgical readiness standards for other surgical specialties, nonsurgeons, nurses, and medical support personnel.

Questions Exist About Capacity of Civilian Centers

The capacity of civilian centers to train large numbers of military personnel is another DOD concern. However, this concern cannot be assessed because DOD has not (1) completed its ongoing reassessment of its medical force structure and (2) determined which personnel will be required to receive such training. DOD has about 480 general surgeons and about 74,000 enlisted active duty medical personnel in the force. Table 4.1 provides a breakdown of active duty medical personnel by type of provider and service for fiscal year 1997.

Table 4.1: Active Duty Medical Personnel by Type of Health Care Provider and Service for Fiscal Year 1997

	Army	Navy	Air Force	Total
Physicians				
General surgeons	149	152	175	**476**
Other surgeons	178	163	204	**545**
Nonsurgical physicians	4,253	3,724	3,752	**11,729**
Subtotal	**4,580**	**4,039**	**4,131**	**12,750**
Other medical personnel				
Physician assistants	600	209	425	**1,234**
Nurses	3,169	3,154	4,478	**10,801**
Enlisted medical personnel	28,497	22,570	22,751	**73,818**
Subtotal	**32,266**	**25,933**	**27,654**	**85,853**
Total	**36,846**	**29,972**	**31,785**	**98,603**

Source: DOD's Health Manpower Personnel Data System.

The total number of deployable personnel who will need trauma care training is expected to change from previous wartime planning scenarios. DOD is updating its April 1994 study of the military medical care system mandated by Section 733 of the National Defense Authorization Act for Fiscal Years 1992 and 1993 to determine the appropriate wartime medical force level requirements. The study concluded that only 50 percent of the active duty medical force was needed for medical readiness, but that finding was very controversial among the services. In March 1995, we testified that the services disagreed with this conclusion and other aspects of the study and that the commanders in chief did not participate in the study.[3] Because of the controversy surrounding the study, the Deputy Secretary of Defense directed that the study be updated to reflect changes in planning scenarios, operational requirements, and number of forces deployed. As of January 1998, DOD had not issued the updated study.

DOD has not determined which medical personnel would need to be trained in trauma care. Not all medical personnel would deploy to a contingency or, if deployed, would provide initial treatment to injured soldiers. For example, not all of the 28,497 Army medics would be deployed to the front lines of a battlefield to provide first responder or enroute care, since Army tactical units require only about 8,900 combat medics. Likewise, not all of DOD's 480 general surgeons would be assigned to combat units or even to the theater. Although DOD would not likely require all medical personnel to be trained in trauma care, DOD may face challenges until it determines

[3]Wartime Medical Care: Aligning Sound Requirements With New Combat Care Approaches Is Key to Restructuring Force (GAO/T-NSIAD-95-129, Mar. 30, 1995).

what portion of the force structure needs trauma care training and the frequency of such training.

No System Is in Place to Identify Trained Personnel

In the event of a crisis, DOD would need to quickly identify which medical personnel have been trained in trauma care. The Combat Trauma Surgical Committee recognized that a system should be in place to identify and track individuals trained in trauma care. Currently, no such system is being used for this purpose since few individuals have received such training. Two systems currently in development—the Centralized Credentials and Quality Assurance System and the Defense Medical Human Resource System—could be used to track trauma care training, but each has limitations.

The Centralized Credentials and Quality Assurance System is limited to credentialed medical providers, such as physicians, physician assistants, and nurse practitioners, and does not include other trauma care providers, such as nurses, combat medics, and corpsmen. In addition, the medical readiness training information displayed in the system is very limited: a medical commander verifies the date of the provider's sustainment medical readiness training certificate. Since a list of criteria or standards outlining what type of training constitutes medical readiness does not exist, this verification is based on the commander's judgment and is therefore subjective.

The Defense Medical Human Resource System is a triservice information system being developed for use in military hospitals and clinics to facilitate patient care and staffing. The system includes all military health care personnel, whether officer or enlisted and credentialed or noncredentialed. The system has the capability to establish and track readiness training requirements by individual, military treatment facility or unit, and service. However, according to service officials, no requirements have been set to develop a template to facilitate tracking of trauma care training. In addition, the system is not designed to identify the training status of medical personnel assigned to nonmedical treatment facilities, such as physicians, medics, and corpsmen assigned to combat units.

Competing Demands Placed on Health Care System Can Limit Medical Readiness Training

DOD must balance the need for training its medical personnel for their wartime mission and the need for delivering peacetime health care services to 8.2 million eligible beneficiaries. Large patient workloads can limit the time military medical personnel can take away from peacetime duties to participate in wartime medical readiness training, including trauma care training. In addition, operating budgets at military treatment facilities can be reduced to the extent that medical personnel participation in training displaces patient workload. Finally, military commanders may lack incentives for providing medical personnel with trauma care training because such training is not linked to wartime readiness.

Although DOD does not provide hands-on trauma care training, it does provide a number of courses for medical officers that provide the basic military skills necessary to operate in the military environment, such as medical service operations and preparation for taking command. Before deployment, military physicians are required to take a course on combat casualty care, which focuses on the military casualty management system and providing casualty care in a battlefield environment. This course consists of classroom instruction and field training and includes the principles of Advanced Trauma Life Support, which were developed by the American College of Surgeons and have become the national and international standard for basic trauma resuscitation skills. However, in 1993, we reported that only 47 percent of active duty physicians attended the combat casualty care course. In 1996, DOD's Office of Inspector General also found that less than 50 percent of a sample of active duty physicians assigned to combat support units had completed the combat casualty care course. According to service officials, medical personnel have limited time to participate in readiness training and often do not attend this training due to patient workloads and budgetary constraints.

DOD's medical mission is to maintain the health of 1.6 million active duty and 6.6 million other military-related eligible beneficiaries, such as active duty dependents and retirees and their dependents, through a system of 115 hospitals and medical centers and 471 clinics worldwide. Active duty personnel are given priority in receiving health care at military treatment facilities. Military-related beneficiaries are entitled to health care at these facilities as space is available.

Military treatment facility commanders are required to manage personnel training within the practical constraints of providing peacetime health care. According to service officials, the operating budgets at military treatment facilities are based on the number of patients seen and

diagnosed for treatment. Therefore, operating budgets may be reduced to the extent that physician participation in readiness training displaces patient workload. Service officials told us that military treatment facility commanders will meet the immediate priority of providing peacetime health care instead of sending staff to medical readiness training courses for a potential wartime mission.

Service officials informed us that the impact of medical readiness training, such as trauma care, on DOD-administered programs that supplement health care provided in the military treatment facilities is unknown but a concern. When a military facility cannot provide health care services because its personnel are at readiness training, patients must obtain services through the civilian sector. DOD pays these cost through TRICARE, DOD's new managed care program that stresses military treatment facility cost-effectiveness.

Commanders may have insufficient incentives for providing medical personnel with trauma care training unless this training is linked to readiness assessments. According to DOD officials, medical readiness training, including trauma care training, is not currently tied to a unit's readiness status for deployment. This status is based on whether essential mission-related equipment and personnel are on hand and required individual and team training has been performed. If a unit is missing some essential items, this information is reflected in the unit's readiness status reporting system, and the unit's status for deployment may be affected.

According to DOD officials, the lack of trauma care training would not be reflected in the unit readiness status reporting system. There is no trauma care training or experience requirement for personnel assigned to units that are to provide care to wartime casualties. For example, a unit's readiness status report would not be degraded if the medical officer assigned to an aid station did not have trauma care training because this training is not part of the unit's required individual or team training. According to DOD officials, a unit commander will use the unit's limited resources and time to train required tasks and not do the other training, such as trauma care, until all mission-essential items have been completed. Although the infancy of the trauma care training program makes it difficult to establish the linkage between trauma training and readiness, many service officials believe that such linkage will be important if trauma training is to receive this needed priority.

Chapter 5

Conclusions and Recommendations

Trauma care training is essential for DOD to successfully fulfill its wartime medical mission. Because of the void left by a lack of priority for combat trauma care training, individual surgeons, military treatment facilities, and combat units have been attempting to meet trauma care training needs on their own. However, command support for these individual efforts has been difficult to sustain because DOD currently has no clear goals or strategy for trauma care training as it relates to medical readiness. Wartime medical readiness should not be the responsibility of individual surgeons, military facilities, or combat units; it warrants the support of and coordination by high-level DOD management.

The Combat Trauma Surgical Committee's report is a good start for developing clear goals for trauma care training. The report's recommendations address the minimum training standards for military general surgeons, but a DOD strategy for meeting those standards has not been developed. Information from DOL's mandated demonstration program at Sentara Norfolk General Hospital could help with the development of such a strategy. The demonstration program could be a good training ground for general surgeons. However, due to the infancy of the program, it has not generated sufficient data useful to determine the effectiveness of training surgeons in civilian trauma centers.

It would be difficult for one training model to provide all the data needed to determine the feasibility and effectiveness of training medical personnel in civilian training centers. Since other programs outside the demonstration program train other military medical personnel, such as orthopedic surgeons, general medical officers, nurses, combat medics, and corpsmen, coordinating data from these programs with the demonstration program could be used to determine the feasibility and effectiveness of training military medical personnel in civilian trauma centers.

Information from the demonstration program and the other trauma training programs already shows that DOD and the services may face some challenges if they are to provide hands-on trauma care training. Some issues, such as licensure, present challenges depending on the location of the civilian training center. Other issues could arise if trauma care training is shown to be effective and feasible. The key questions to be answered then would be who should receive trauma care training and how will those personnel be identified. Currently, DOD does not have a mechanism to identify those trained in trauma care, but those who would deploy first to a contingency would need to receive priority for such training.

Recommendations

Additional data is needed to evaluate the feasibility and effectiveness of providing trauma care training to military personnel in civilian centers. Because the authority for the demonstration program at Sentara Norfolk General Hospital expires on March 31, 1998, we recommend that the Secretary of Defense consider negotiating a new agreement for a similar program. We also recommend that the Secretary (1) expedite DOD's efforts to establish an evaluation tool to assist in this assessment and (2) broaden the scope of the evaluation to include other individual programs that have provided trauma care training to general surgeons as well as other medical personnel.

In addition, if DOD determines that the trauma care training concept is feasible and decides to expand such training in civilian trauma care centers, we recommend that the Secretary of Defense develop a long-term strategic plan that establishes goals and identifies actions and appropriate milestones for achieving these goals. This plan should (1) establish criteria for selecting locations for trauma care training that would maximize the experiences of military trainees, (2) identify which medical personnel should receive trauma care training and the frequency of such training, and (3) develop a mechanism to identify those military medical personnel who are likely to deploy early in a conflict so that they can receive priority for medical wartime trauma care training. This plan should also address the training needs of the active and reserve components.

Agency Comments and Our Evaluation

In official oral comments on a draft of this report, DOD generally concurred with our recommendations. DOD noted that it has determined that the trauma care training concept is feasible for general surgeons, although there is not yet sufficient data to determine the effectiveness of the training. DOD is also currently evaluating the concept for other military medical personnel. We agree with DOD that the demonstration program and the other individual trauma training programs have shown that it is feasible to train general surgeons in civilian trauma centers and that additional data is needed for other military medical personnel. The general surgeons who have trained in the civilian centers have been given opportunities to perform hands-on procedures on severely injured patients and participate in decision-making skills. Many of the trainees stated that the training in the civilian centers renewed their confidence for treating severely wounded patients. Even though the demonstration program and the other initiatives have shown that it is possible to train surgeons in civilian trauma centers, the impact on the delivery of DOD peacetime health care when the program is expanded DOD-wide is still unknown.

DOD stated that it plans to negotiate a new agreement with Sentara Norfolk General Hospital to provide trauma care training. DOD also agreed with our recommendation to facilitate development of an evaluation tool to help in the assessment of the effectiveness of trauma care training. DOD plans to expand this evaluation to include other individual trauma care training programs beyond the demonstration program. DOD also plans to establish panels to determine trauma care sustainment training needs for military medical personnel in addition to those created for general surgeons. Regarding our recommendation that DOD develop a long-term strategic plan that establishes goals and identifies actions and appropriate milestones, DOD stated that, in February 1998, the Combat Trauma Surgical Committee reconvened to coordinate with the services to develop and implement trauma care training plans for both the active and reserve components that are directed toward building a long-term strategy.

DOD stated that potential military training sites for reserve personnel could include the three military treatment facilities in Texas that treat trauma patients—Brooke Army, Wilford Hall, and William Beaumont Army Medical Centers. However, we believe that these facilities may not be viable training sites because their low volume of trauma admissions and their current staffing levels preclude the centers from providing sustainment training for military medical personnel not already assigned there.

DOD also stated it has specific concerns regarding (1) the additional costs for licensure and credentialing of providers, (2) costs for additional civilian trauma training opportunities, and (3) the sustainment costs of what will have to become a new readiness mission. We did not identify any significant financial impact regarding the demonstration program. For example, only nominal costs were incurred for trainee licenses. In addition, due to the close proximity of the Naval Medical Center Portsmouth to Sentara Norfolk General Hospital, no travel or temporary duty costs were incurred for the trainees. Finally, no additional staffing was required at Naval Medical Center Portsmouth to cover patient workload. We recognize that cost is a factor that DOD must consider in selecting civilian training locations. We note that the extent to which DOD might incur additional costs depends on the agreement reached between the military organization and the specific civilian site selected.

Appendix I

Battlefield Diagnoses and Peacetime Health Care

The Department of Defense's (DOD) wartime medical mission is to preserve the fighting force. One primary goal to achieve this mission is to treat combat injuries on the battlefield and return personnel to duty as soon as possible and safeguard those who cannot return to duty. Historically, 90 percent of trauma sustained in combat on the battlefield has resulted from penetrating missiles, mostly bullets from small arms and fragments from explosive munitions.

The care furnished in military medical centers bears little resemblance to most of the penetrating wounded-in-action injuries that medical personnel will treat in wartime. The most frequent diagnoses in military treatment facilities are pregnancies and live births. In fact, none of the 50 most frequent peacetime diagnoses at military medical centers match a wounded-in-action condition.

According to DOD, peacetime medical care is an important element of training for the wartime mission because many of the medical services provided in war are for diseases and nonbattlefield-related injuries that are also seen and treated during peacetime. Historically, diseases and nonbattlefield-related injuries have accounted for between 69 and 96 percent of all care provided in wartime. However, a 1995 Congressional Budget Office report concluded that peacetime care in military medical facilities bears little correlation to many of the diseases and nonbattlefield-related injuries.[1] Table I.1 shows the lack of a correlation between the top five diagnoses expected during wartime (wounded-in-action injuries, nonbattlefield-related injuries, and diseases) and the top five diagnoses seen in military treatment facilities in fiscal year 1997.

[1]Restructuring Military Medical Care, Congressional Budget Office, July 1995.

Table I.1: Top Five Wounded-in-Action Injuries, Nonbattlefield-Related Injuries, and Diseases Expected in Wartime and Top Five Peacetime Diagnoses in Fiscal Year 1997

	Wartime care			Peacetime care
Rank	**Wounded-in-action injury**	**Nonbattlefield-related injury**	**Disease**	
1	Lower leg open penetrating wound with fracture	Heat exhaustion	Diarrhea	Single infant born without caesarean delivery
2	Thigh open penetrating wound with fracture	Sprained ankle	Upper respiratory infection	Single infant born by caesarean section
3	Multiple, nonperforating fragment wounds of skin and soft tissue	Heat cramps	Fever	Uterus and ovary procedures for nonmalignancy
4	Upper arm open wound with fracture and nerve injury	Blisters of hands, fingers, feet, and toes due to friction	Respiratory disease	Knee procedure
5	Lower leg open penetrating wound without fracture	Sprained wrist	Athlete's foot	Esophagus, gastrointestinal, and other digestive disorders

Additional training may be needed to bridge the gap between the knowledge acquired in civilian trauma centers and the actual delivery of combat casualty care on the battlefield. This military-specific training would highlight the difference between the civilian experience and what is expected in a battlefield environment. For example, in civilian trauma systems, the principles of advanced trauma life support discourage the use of tourniquets and recommends direct pressure to the wound to stop major bleeding. However, in a battlefield environment, a tourniquet is considered the most reasonable choice to stop bleeding and prevent death.

Organizations Visited or Contacted

Department of Defense	Office of the Assistant Secretary of Defense for Health Affairs Office of the Assistant Secretary of Defense for Reserve Affairs Joint Staff Logistics Directorate, Medical Readiness Division Defense Medical Readiness Training Institute Special Operations Command, Office of the Command Surgeon Uniformed Services University of the Health Sciences
Army	Office of the Army Surgeon General Army Medical Department Army Special Operations Command, Office of the Command Surgeon Army Forces Command, Office of the Command Surgeon Southeast Regional Medical Command, Readiness Walter Reed Army Medical Center, Borden Institute
Navy	Office of the Navy Surgeon General Navy Bureau of Medicine and Surgery Naval Special Warfare Command Naval Health Research Center I Marine Expeditionary Force, Surgeon's Office First Marine Division, Surgeon's Office Third Marine Aircraft Wing, Office of the Wing Medical Officer
Air Force	Office of the Air Force Surgeon General Air National Guard Readiness Center, Surgeon General
Military Treatment Facilities	Naval Medical Center Portsmouth Naval Medical Center San Diego Naval Hospital Camp Pendleton Wilford Hall Medical Center Brooke Army Medical Center William Beaumont Army Medical Center Dwight David Eisenhower Army Medical Center
U.S. Health Care Organizations	American College of Surgeons, Committee on Trauma American Trauma Society National Registry of Emergency Medical Technicians Federation of State Medical Boards

Private U.S. Hospitals

Sentara Norfolk General Hospital, Norfolk, Virginia
Martin Luther King, Jr./Drew Medical Center, Los Angeles, California
Mercy Hospital and Medical Center, San Diego, California
R. Adams Cowley Shock Trauma Center, Baltimore, Maryland
Ben Taub General Hospital, Baylor College of Medicine, Houston, Texas
Grady Memorial Hospital, Atlanta, Georgia
D.C. General Hospital, Washington, D.C.

State and City Governments

California State Medical Board
Georgia State Professional Examining Board
Texas State Board of Medical Examiners
Texas State Board of Nurse Examiners
Texas State Board of Vocational Nurse Examiners
State of Maryland, Department of Health and Mental Hygiene, Board of Physician Quality Assurance
Commonwealth of Virginia, Department of Health Professions, Board of Medicine
City of Santa Ana, California, Fire Department

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